The Monthly Evening Sky Map

A SCIENTIFIC JOURNAL AND EDUCATIONAL GUIDE IN ASTRONOMY FOR THE AMATEUR

Founded in 1905 by Leon Barritt

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - MORNING AND EVENING - AND PRACTICAL ANYWHERE IN THE WORLD

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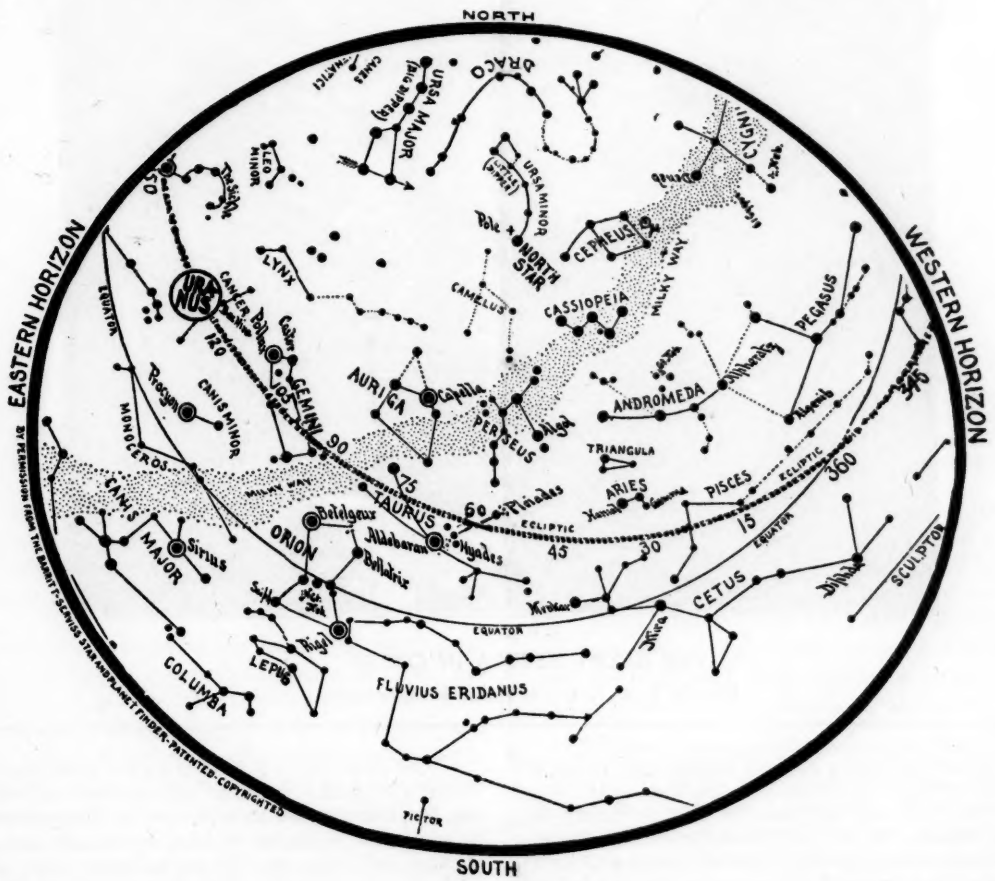
EVENING SKY MAP FOR JANUARY



AT 9:00 P.M., JAN. 1 **8:00 P.M., JAN. 15** **7:00 P.M., JAN. 31**

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

THE CONSTELLATION OF ORION

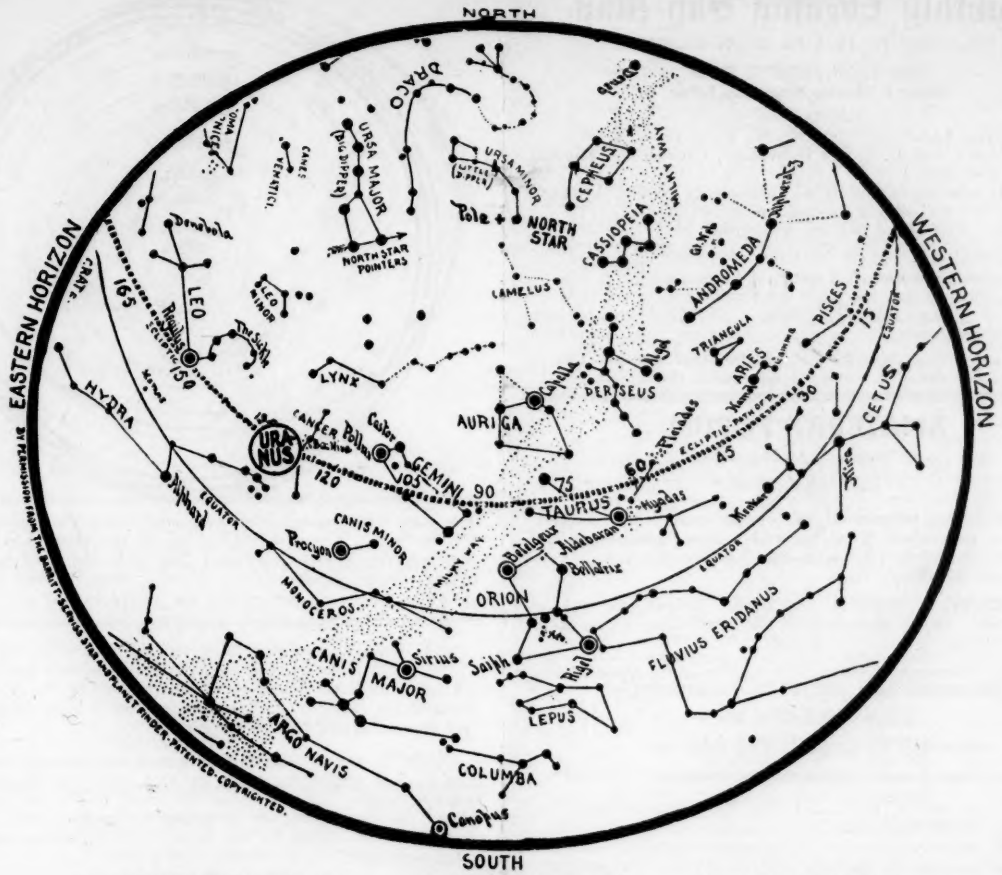
THE GREAT NEBULA IN ORION

Photo by W. G. Ritchey at The Yerkes Observatory

If you wish to make a life-long friend, learn to know the splendid constellation Orion. It is the finest in the sky, the most easily learned, and has the greatest variety of interesting objects. Fix in your mind the oblong frame, note the three stars in line close together forming Orion's belt, and the three stars still close together hanging below the belt and forming his sword, then go out on a clear night and face the south (we are supposing that you live in northern latitudes). On a moonless night, many more stars will be visible than shown on the charts, which registers the brighter ones only,—such as will appear a week later when there is a half-moon in the sky to drown out the fainter stars. Strong electric lights will have the same effect as the moon.

On some evening look at Orion every hour; by so doing a surprisingly number of beginners will learn for the first time that the stars rise and set like the sun. Note it every few nights for at least one month, and a large number will learn that the constellations drift westward with the advancing year. With the exception of the reddish star, Betelgeuse, at the upper left-hand corner, probably all the other bright stars of this constellation belong in one system. which is so far distant from us that its light which reaches the earth today may well have been over six thousands years on the way, although light travels at the rate of 186,000 miles a second. On account of this great distance, the stars of this constellation are not more brilliant than others despite the fact that many of them are truly

EVENING SKY MAP FOR FEBRUARY



AT 9:00 P.M., FEB. 1 **8:00 P.M., FEB. 15** **7:00 P.M., FEB. 28**

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

giants. Thus, the lowest star in the sword has been estimated by Professor W. H. Pickering to be 210,000 more brilliant than our sun, and the first magnitude star in the lower right-hand corner, Rigel, to be 2,100,000 times more brilliant!

Look carefully at the middle star in the sword on a clear moonless night; it will appear hazy and unlike the other stars. It is, in fact, the magnificent nebula shown in the illustration. With two exceptions, the Andromeda nebula and Messier 8, this is the only nebula visible to the naked eye. It consists of gas moving in diverse currents and the distance across it is as great as the distance from the earth to the nearest star. Probably connected with it, coiled loosely around he betlt and extending from one end of the constellation to the other, is a huge, but exceedingly faint nebula, so faint as to be hardly photographable, and so vast as to require a thousand years or more for light to travel across it.

The belt has been called the Yard Stick, for it is three degrees long and makes a convenient unit for measuring angular distances among the stars. Strange as it now seems, the belt was once named in honor of Napoleon by German scientists, and immediately rechristened Nelson by the English. The French called it the rake. The belt points toward the southeast almost directly to the most conspicuous star in the whole sky, the dog star, Sirius, and again, at almost the same distance from it in the opposite direction, to the red star, Aldebaran, in the constellation Taurus.

When you become really interested in Orion you should learn the names of its brightest stars; which are old, and which are young; which ones are double, which triple, which sextuple; why some of them vary in their brightness; how it is known that the nebula is gaseous and has diverse currents and that the earth is running away from this constellation at the rate of about ten miles a second. All this may be learned without a knowledge of mathematics.

Then let a little of this information leak out to your friends on propitious occasions, and you will be surprised at the warm glow a look at this constellation will give you ever afterwards.

The

Monthly Evening Sky Map

FOUNDED IN 1905 BY LEON BARRITT

MRS. LEON BARRITT, Editor
Irving L. Meyer, Managing Editor

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All time is expressed in Eastern (75th Meridian) Standard Time. Add five hours to convert to Greenwich Civil Time.

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

JANUARY, 1958

THE SUN: has commenced its journey toward the northern hemisphere, and travels from Sagittarius into Capricornus. The earth is in *perihelion* (closest to the Sun) on the 3rd at 91.3 million miles distance.

THE MOON: is closest to the earth *(perigee)* the 8th at 228,000 miles, and is farthest from the earth *(apogee)* the 24th at 252,000 miles.

Libration: Maximum exposure of the regions on the Moon's limbs takes place as follows:

January	3	East	limb, 5.9°
January	7	North	limb, 6.5°
January	17	West	limb, 5.0°
January	20	South	limb, 6.5°
January	31	East	limb, 7.2°

The Moon's Phases (E.S.T.):

Full Moon	January 5 at 3:09 pm
Last Quarter	12 at 9:01 am
New Moon	19 at 5:08 pm
First Quarter	27 at 9:16 pm

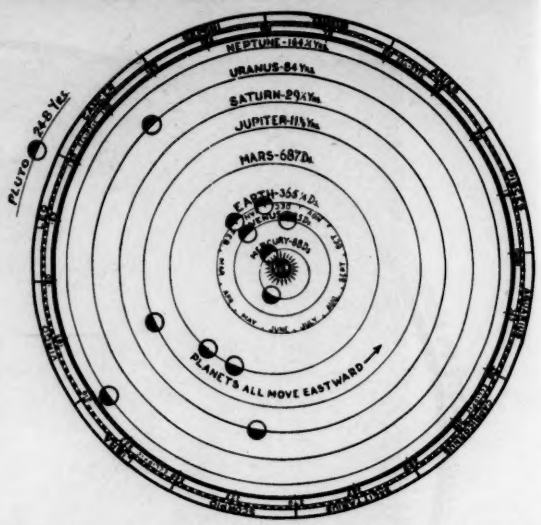
MERCURY: is in the morning sky the entire month, moving from Ophiuchus into Sagittarius. On the 15th it achieves greatest elongation west of the Sun, 23° 53', and will therefore be observable for a few days around the 15th. It will be seen close to the horizon in the east as twilight brightens the morning sky. Magnitude will be 0.0, and the 7" diameter disc will be slightly gibbous (as seen in a telescope). Geocentric distance increases from 67,000,000 miles to 115,000,000 miles during the month.

VENUS: retrogrades most of the month, through northern Capricornus and southwestern Aquarius. Visible in the evening sky the beginning of the month, it moves repidly toward inferior conjunction with the Sun, which takes place the 28th, and thereupon enters the morning sky. Venus is uniquely interesting during January; it appears under moderate magnification as an extremely thin crescent, the cresent extending more than half-way around the disc as a result of the Sun's shining through the planet's atmosphere. A telescope of 6-inch diameter, equipped with setting circles will enable anyone to pick up the planet in broad daylight, right up to conjunction. At the beginning of the month, distance is 34 million miles, and apparent diameter 46"; at its closest point on the 28th, distance is 25 million miles and apparent diameter 1' 2".

MARS: is in the late morning sky, moving from Scorpio, through lower Ophiuchus, into Sagittarius. It is now approaching the earth, and as the months go by, will become better placed for observation, larger, and brighter. On the 1st, distance is 211 million miles, diameter is 4", and magnitude 1.8; on the 31st, distance is 193 million miles, diameter is 4½", and magnitude is 1.6. On the 23rd, it is in conjunction with Saturn, passing about a degree and one-half to the south.

JUPITER: is near Neptune, in Virgo. It rises shorty after midnight most of the month, and is becoming well placed for observation. Binoculars will reveal the flattened disc and the four bright satellities. A small telescope will show the cloud-bands across the disc. On the 15th, distance is 508 million miles, magitude is -1.5, and equatorial diameter is 36".

HELIOCENTRIC POSITIONS OF THE PLANETS, JANUARY



The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month are given for Mercury, Venus, Earth, and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus, Neptune, and Pluto are shown in their mean position for the current month.

SATURN: is another morning star, in Ophiuchus. By the end of the month it can be observed in the pre-dawn sky near the eastern horizon. Magnitude is about 0.8 throughout the month; ring diameter averages 35"; and distance the 15th is 1008 million miles. Not yet well placed for observation.

URANUS: near Praesepe, in Cancer, is a sixth-magnitude planet. Under ideal conditions it can be seen with the naked eye. A magnification of 50x will reveal the small, round disc. It is well placed for observation, as it comes to opposition the 29th. On that date it is closest to the earth, at 1626 million miles, and magnitude is 5.7.

NEPTUNE: is south of the equator, in Virgo. This remote giant is not visible to the naked eye, as its magnitude is about 8. It rises about midnight, and is still a few months from opposition. A magnification of 100x will reveal the small, dullish disc of the planet. Distance the 15th is 2832 million miles.

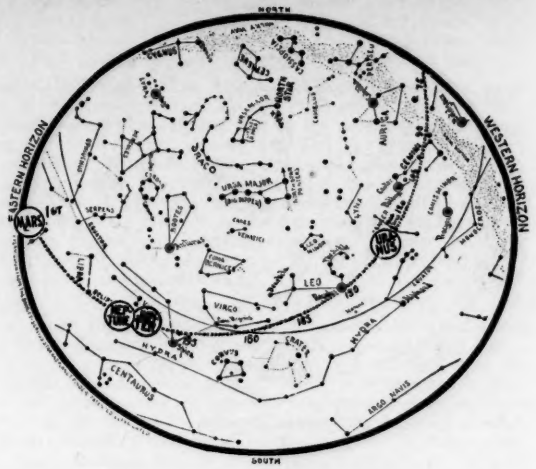
ASTRONOMICAL CALENDAR

Eastern Standard Time

JANUARY, 1958

Jan.	1—10:21 am	Minimum of Algol
	2— 4:— am	Mercury greatest heliocentric latitude north
	3— 9:— am	Earth in perihelion
	4— 7:10 am	Minimum of Algol
	5— 4:— am	Mercury stationary in Right Ascension
	6— 3:— am	Venus stationary in Right Ascension
	7— 3:59 am	Minimum of Algol
	7—12:33 pm	Conjunction, Uranus and Moon; Uranus north 5° 55'
	8—12:— am	Mars in descending node
	10—12:48 am	Minimum of Algol
	12— 9:38 pm	Minimum of Algol
	13—12:12 am	Conjunction, Jupiter and Moon; Jupiter north 2° 0'
	13— 8:17 am	Conjunction, Neptune and Moon; Neptune north 2° 3'
	15— 6:27 pm	Minimum of Algol
	15—11:— pm	Mercury greatest elongation west, 23° 53'
	16—10:06 am	Conjunction, Mars and Moon; Mars south 3° 19'
	16— 5:47 pm	Conjunction, Saturn and Moon; Saturn south 2° 9'
	17— 4:50 pm	Conjunction, Mercury and Moon; Mercury south 3° 0'
	18— 3:16 pm	Minimum of Algol
	20— 6:52 pm	Conjunction, Venus and Moon; Venus north 0° 40'

MORNING SKY MAP FOR JANUARY



At 5:00 A.M., JAN. 1; 4:00 A.M., JAN. 15; 3:00 A.M., JAN. 31

21—	12:— am	Quadrature, Jupiter and Sun
21—	12:05 pm	Minimum of Algol
23—	5:— am	Conjunction, Mars and Saturn; Mars south 1° 31'
24—	8:55 am	Minimum of Algol
25—	12:— am	Quadrature, Neptune and Sun
25—	3:— pm	Mercury in descending node
27—	5:44 am	Minimum of Algol
28—	3:— pm	Inferior conjunction, Venus and Sun; Venus north 7° 10'
29—	7:— pm	Opposition, Uranus and Sun
30—	2:33 am	Minimum of Algol
30—	3:— am	Venus in perihelion

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

FEBRUARY, 1958

THE SUN: continues its climb toward the northern hemisphere. It leaves Capricornus, to enter Aquarius. The earth's distance increases slightly, from 91.5 million miles the 1st, to 92.0 million miles the 28th.

THE MOON: is closest to the earth the 5th at 224,000 miles, and is farthest the 21st at 252,000 miles.

Libration: Maximum exposure of the regions on the Moon's limbs takes place as follows:

February	4	North limb, 6.5°
February	13	West limb, 6.2°
February	17	South limb, 6.6°
February	28	East limb, 8.0°

The Moon's Phases (E.S.T.):

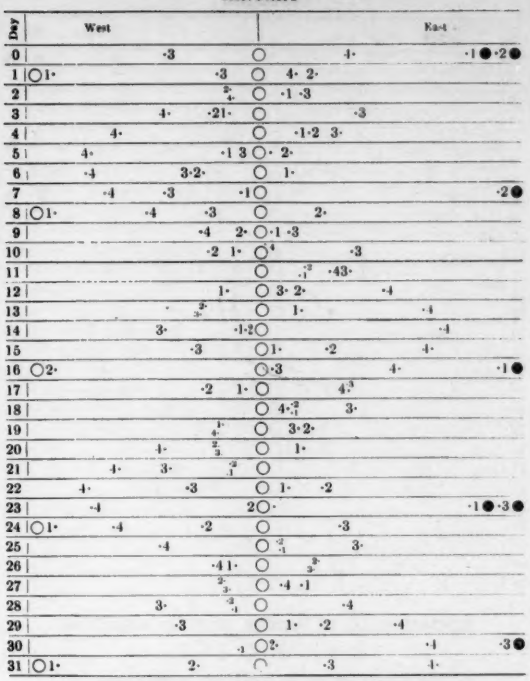
Full Moon	February 4 at 3:05 am
Last Quarter	10 at 6:34 pm
New Moon	18 at 10:38 am
First Quarter	26 at 3:51 pm

MERCURY: moves from a point on the Sagittarius-Capricornus boundary, through Caparicornus, into Aquarius. It is in the morning sky, but too close to the Sun the entire month to be observable. Distance increases from 116 million miles the 1st, to a maximum of 129 million miles the 24th.

VENUS: moves in a short arc close to Alpha and Beta Capricorni, in the morning sky. By the end of the month it is readily observable before dawn. Geocentric distance is now increasing—from 25 million miles the 1st, to 36 million miles the 28th—causing apparent diameter to decrease from 62" to 43". The planet will appear at the beginning of the month as an extremely thin crescent—only about 1% illuminated—filling out to about 20% illuminated by month-end. Magnitude increases from -3.3 to -4.3.

SATELLITES OF JUPITER

JANUARY



Appearance of Jupiter and its satellites at 5:30 A.M., E.S.T. as seen in an inverting telescope

MARS: shines as a bright, reddish star in the late morning sky, moving from the western edge of Sagittarius to the eastern edge. Great distance from the earth (193 million miles the 1st; 175 million miles the 28th) keeps apparent diameter small—about 5". Brightness incresses from 1.6 to 1.4 magnitude.

JUPITER: holds sway in Virgo, and rises shortly before midnight. This is probably the most readily observable planet for small instruments. Though its disc is smaller than that of Venus when the latter is closest to the earth, it is still large enough to be detectable in binoculars. Plus, the flattening at the poles is readily discerned, and with moderate power on a telescope, the cloud bands across the disc can be made out. The four brightest satellites are visible in opera glasses—in fact, some observers claim to have seen them with the naked eye. On the 15th, distance is 462 million miles, diameter is 39" through the equator, about 3" less through the poles, and magnitude -1.8, second only to Venus.

SATURN: is another morning sky object, in Ophiuchus. It is getting better placed for observation, but still necessitates the observer's rising before dawn to gain satisfactory observing conditions. The ring is a splendid sight in the smallest telescopes. In addition, a power of upward to 100 will reveal cloud bands like Jupiter's, but less distinct; and Titan, the brightest satellite, is an easy object. Distance the 15th is 973 million miles.

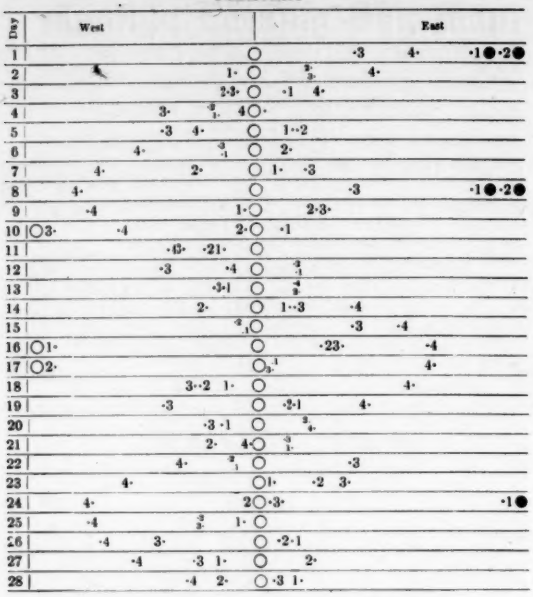
URANUS: is the only true evening sky planet. Just past opposition, it shines at magnitude 5.7, enabling the keen-eyed observer to sight it with the naked eye. In Cancer, it is particulary favorable to the northern hemisphere observer. Distance the 15th is 1629 million miles.

NEPTUNE: is close to Jupiter, in Virgo. In contrast to Jupiter, Neptune is a dull, lusterless planet at best. Invisible to the naked eye, good binoculars will reveal it as a starlike point. It is very remote—2783 million miles the 15th.

PLUTO: crawls slowly about in an area of Leo near the Sickle. This, the most remote of the planets, is not much larger than the major satellites of Jupiter, and accordingly, shines with a very feeble light—about magnitude 14. At its closest to the earth at this opposition (on the 20th) distance is 3095 million miles. Well placed for observation.

SATELLITES OF JUPITER

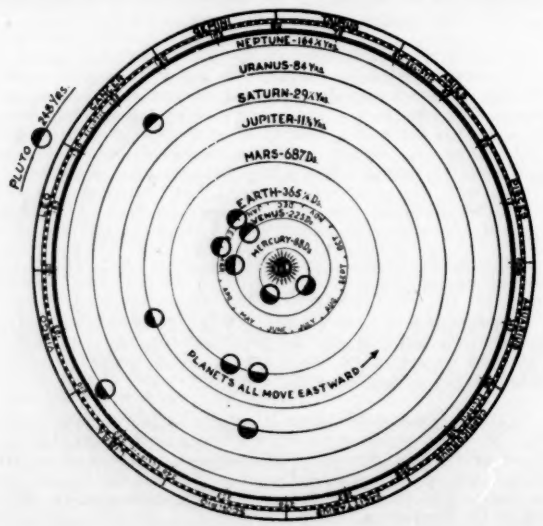
FEBRUARY



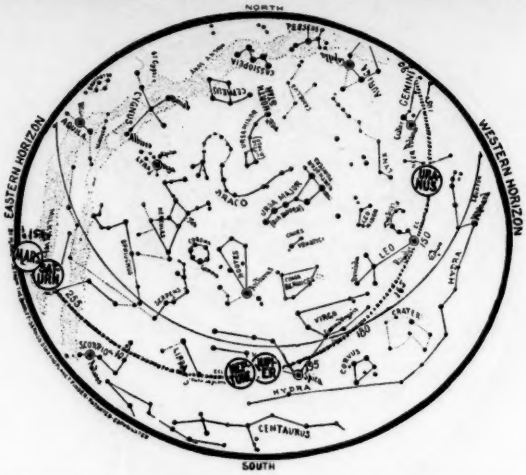
Appearance of Jupiter and its satellites at 4:15 A.M., E.S.T. as seen in an inverting telescope

Jupiter is represented by the disc in the center of the chart, and each satellite by a dot and its appropriate number. The direction of the staellite's motion is from the dot toward the numeral. The numeral and light disc at the left margin of the chart indicates a satellite in transit across Jupiter's disc; the numeral and dark disc at the right margin indicates a satellite which is invisible because it is being eclipsed or occulted by Jupiter. This chart must be held upside down if binoculars, opera glasses, or an erecting type telescope is used.

HELIOCENTRIC POSITIONS OF THE PLANETS, FEBRUARY



MORNING SKY MAP FOR FEBRUARY



AT 5:00 A.M., FEB. 1; 4:00 A.M., FEB. 15; 3:00 A.M., FEB. 28

ASTRONOMICAL CALENDAR

Eastern Standard Time

FEBRUARY, 1958

Feb.	1—11:23 pm	Minimum of Algol
	3— 8:33 pm	Conjunction, Uranus and Moon; Uranus north 5° 52'
	4— 8:12 pm	Minimum of Algol
	4— 9:— pm	Mercury in aphelion
	5— 4:— pm	Neptune stationary in Right Ascension
	7— 2:— am	Conjunction, Mercury and Venus; Mercury south 9° 36'
	7— 5:01 pm	Minimum of Algol
	9— 8:45 am	Conjunction, Jupiter and Moon; Jupiter north 1° 40'
	9— 2:11 pm	Conjunction, Neptune and Moon; Neptune north 1° 47'
	10— 1:51 pm	Minimum of Algol
	13— 3:59 am	Conjunction, Saturn and Moon; Saturn south 2° 29'
	13—10:40 am	Minimum of Algol
	14— 6:49 am	Conjunction, Mars and Moon; Mars south 5° 0'
	15— 8:— pm	Jupiter stationary in Right Ascension
	16— 1:17 am	Conjunction, Venus and Moon; Venus north 2° 36'
	16— 7:29 am	Minimum of Algol
	17— 1:— pm	Venus stationary in Right Ascension
	17— 4:05 pm	Conjunction, Mercury and Moon; Mercury south 7° 15'
	19— 4:18 am	Minimum of Algol
	20—12:00 am	Opposition, Plutto and Sun
	20—11:— pm	Venus greatest heliocentric latitude north
	22— 1:08 am	Minimum of Algol
	24— 9:57 pm	Minimum of Algol
	25— 5:— am	Mercury greatest heliocentric latitude south
	27— 6:46 pm	Minimum of Algol

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

MARCH, 1958

THE SUN: arrives at the equator on the 20th, bringing spring to the northern hemisphere, and fall to the southern. It moves from Aquarius into Pisces. Distance increases from 92.0 to 92.8 million miles during the month.

THE MOON: is closest to the earth the 6th at 222,000 miles, and is farthest the 20th at 253,000 miles.

Libration: Maximum exposure of the regions on the Moon's limbs takes place as follows:

March 3 North limb, 6.6°
March 13 West limb, 7.2°
March 16 South limb, 6.7°
March 29 East limb, 8.0°
March 30 North limb, 6.8°

The Moon's Phases (E.S.T.):

Full Moon	March 5 at 1:28 pm
Last Quarter	12 at 5:48 am
New Moon	20 at 4:50 am
First Quarter	28 at 6:18 am

MERCURY: treks from Aquarius through Pisces, to a point close to the Aries boundary. Its very rapid motion carries it from Superior Conjunction with the Sun on the 3rd, to greatest elongation (east) of 18° 52" on the 29th. Thus, it is an evening sky object most of the month, and can be observed shortly after sunset, close to the western horizon. Like the Moon and Venus, this planet shows all phases; at elongation, approximately one-half illuminated and changing to a crescent in the following days. Magnitude is about 0.0. Elusive, but satisfying to observe. Distance the 1st is 128 million miles, and diameter is 5"; the 31st, distance is 79 million miles, and diameter 8".

VENUS: is queen of the late morning sky. In Capricornus the entire month, it is now well placed for observation. On the 4th it achieves greatest brilliancy—magnitude -4.3—and shines like a great white gem in the black sky. It is now receding from the earth, but a greater area of the surface is illuminated as seen from the earth, causing the increased brightness. Telescopes reveal little detail on this disc—apparently the surface is heavily clouded. It is an expanding crescent all month, apparent in the smallest telescopes. Distance the 1st is 37 million miles; the 31st, 57 million miles. Diameter decreases from 43" to 27".

MARS: moves from Sagittarius into Capricornus, in the late morning sky. It is not far from Venus, but much less brilliant. Mars, the most studied of all planets, is still too far away for amateur telescopes, though its disc averages better than 5". It is about 90% illuminated, showing a distinct gibbous phase, much like the Moon a couple days from full. Magnitude increases from 1.4 to 1.1, as distance decreases from 174 to 155 milion miles.

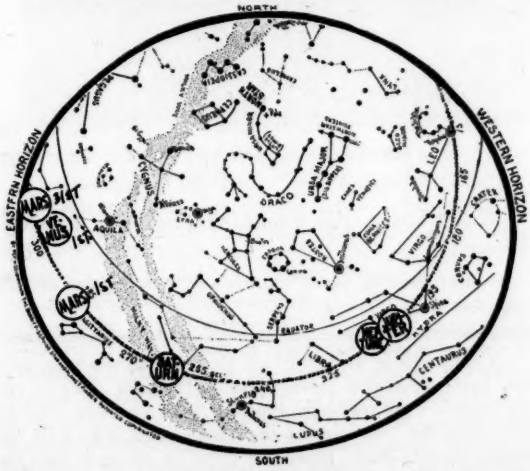
JUPITER: rises shortly after dark, and assumes command of the night sky. It is approaching opposition, and is brightening slightly and increasing in apparent diameter slightly as the days go by. The four main satellites are very interesting—their positions are shown elsewhere in the MAP. On the 15th, distance is 429 million miles, magnitude is -1.9, and equatorial diameter is 43". In Virgo all month.

SATURN: in the morning sky in Ophiuchus, it rises at about midnight. Bright (magnitude 0.7) and most interesting to the telescope user, its unique ring system, large disc, cloud bands, and satellites repay observation well. Distance the 15th is 931 million miles.

URANUS: in Cancer, is the only true evening star, other than the very faint Pluto. Uranus, under 50 power, presents a nice round, greenish disc. A sixth magnitude object, it is most easily seen with optical aid. It is far away—1651 million miles, the 15th.

NEPTUNE: in Virgo, close to giant Jupiter, is a faint, 8th magnitude planet, visible only with optical aid. Though not very interesting, it is a source of satisfaction to pick this planet out with certainty from the many similar-looking stars. A telescope of 100 power will reveal the small disc. Distance the 15th is 2747 million miles.

MORNING SKY MAP FOR MARCH



AT 5:00 A.M., MAR. 1; 4:00 A.M., MAR. 15; 3:00 A.M., MAR. 31

SATELLITES OF JUPITER

MARCH

Day	West							East						
1					·2·1	·4	○			·3				
2							○	1·	4 2	3·				
3						·1	○	2·	3·		·4			
4	○1·				2·	3·	○					·4		
5				3·			○	·1					·4	·2●
6					·3	1·	○		2·			4·		
7						2·	○3	·1			4·			
8						·2	·1 ○			·3	4·			
9							○	1 4	·2	3·				
10						4·	·1 ○	2·	3·					
11				4·		2·	3· 1 ○	·						
12			4·	3·			○1							·2●
13		4·			·3		1· ○		2·					
14		·4					3 2 ○	·1						
15			·4			·2	1· ○			·3				
16				·4			○	3 1			3·			
17					·4	·1	○	2·	3·					
18					2·		3· ○	4 1						
19				3·			·2 ○			·4				·1●
20				·3			1· ○		·2		·4			
21	○2·					·3	○	·1				·4		
22					·2	1·	○		·3				·4	
23							○	·2	1	·3		4·		
24						·1	○		2·	3·		4·		
25					2·		3 ○	1·		4·				
26				3·			·2 4 ○	1						
27	○1·			·3		4·	○		·2					
28			4·			·3	2 ○	·	·1					
29		4·			·2	1·	○		·3					
30		4·					○	·2	·1		·3			
31		·4				·1	○		2·	3·				

Appearance of Jupiter and its satellites at 2:45 A.M., E.S.T. as seen in an inverting telescope

ASTRONOMICAL CALENDAR

Eastern Standard Time

MARCH, 1958

March	2— 3:36 pm	Minimum of Algol
	3— 5:47 am	Conjunction, Uranus and Moon; Uranus north 5° 58'
	3— 3:— pm	Superior conjunction, Mercury and Sun; Mercury south 1° 45'
	4— 5:— am	Venus at greatest brilliancy
	5—12:25 pm	Minimum of Algol
	8— 9:14 am	Minimum of Algol
	8— 4:04 pm	Conjunction, Jupiter and Moon; Jupiter north 1° 37'
	8— 9:50 pm	Conjunction, Neptune and Moon; Neptune north 1° 37'
	11— 6:03 am	Minimum of Algol
	12—12:44 pm	Conjunction, Saturn and Moon; Saturn south 2° 46'
	14— 2:53 am	Minimum of Algol
	15— 6:20 am	Conjunction, Mars and Moon; Mars south 6° 11'
	16— 6:— am	Mercury in ascending node
	16— 6:00 am	Conjunction, Venus and Moon; Venus south 1° 17'
	16— 7:— am	Quadrature, Saturn and Sun
	16—11:42 pm	Minimum of Algol
	19— 8:31 pm	Minimum of Algol
	20— 9:— pm	Mercury in perihelion
	21—10:06 pm	Sun enters the *sign* of Aries; Equinox
	21— 4:58 pm	Conjunction, Mercury and Moon; Mercury south 0° 12'
	22— 5:21 pm	Minimum of Algol
	25— 2:10 pm	Minimum of Algol
	28—10:59 am	Minimum of Algol
	29— 2:— am	Mercury greatest elongation east, 18° 52'
	30— 2:31 pm	Conjunction, Uranus and Moon; Uranus north 6° 5'
	31— 3:— am	Mercury greatest heliocentric latitude north
	31— 7:48 am	Minimum of Algol

NEW MOONS

What are the possibilities of finding new moons in the solar system? Not very likely, but according to R. S. Richardson of the Mount Wilson and Palomar Observatories *(A.S.P. Leaflet,* no 316) there is still some chance. It would be particularly useful to discover moons around Mercury, Venus or Pluto. These planets have no known satellites, and consequently their masses can be determined only from their disturbing effects on other bodies. This requires very long series of painstaking observations. In contrast, once a satellite's period of revolution and distance from its primary are found, a few minutes' computation using Kepler's third law, yields the mass of the planet with considerable accuracy. As well as giving the over-all mass of the planet, the motion of a satellite may give information about the distribution of mass inside the planet.

The mass of Mercury has been found from its effects on the motion of Encke's comet, when it was close about 1842. This value is 20 per cent. less than another value determined in 1950 from observations of the asteroid Eros.

From the disturbing effect of Venus on the motion of Mercury over the interval 1765 to 1937, G. M. Clemence arrived at a value for the mass of Venus of 1/490,000 that of the sun. Other workers, analysing the effect of Venus on the motion of the earth, found a mass of 1/407,000 that of the sun.

The mass of Pluto is the least reliable. Its effect on the motions of Uranus and Neptune is small. The mass is estimated to be about equal to that of the earth. However, combining this with the diameter of 3680 miles, measured with the 200-inch telescope in 1948, leads to the unusually high value of the density of Pluto of ten times that of the earth. In order to improve the mass of Pluto, observations taken over another century will be needed, unless a satellite is discovered.

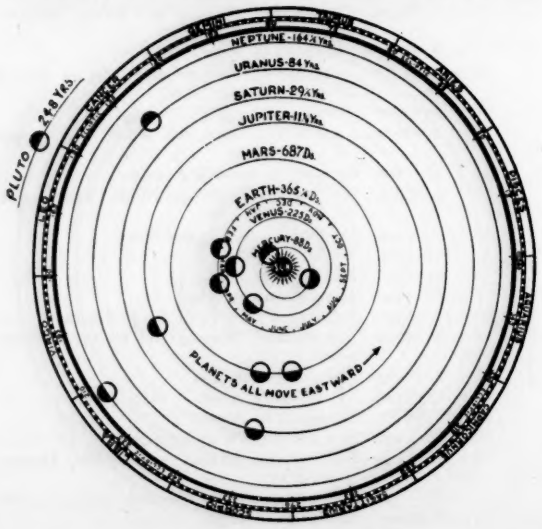
The difficulty in searching for a satellite of either Mercury or Venus is the proximity of each of these planets to the sun. In fact it seems that it would be virtually impossible to detect a satellite of Mercury. In the case of Venus, the best time to search would be when the planet is brightest, either before sunrise or after sunset. The planet is then in a crescent phase; a satellite would show the same phase. A satellite would be easiest to detect when at its elongation. The chances of this occurring during the short period available for observation are rather slight.

To detect a satellite of Pluto would require the 200-inch telescope. In order for the image of a satellite to be separated from that of Pluto, and thus detected, the satellite would have to be about 100,000 miles from the planet.

Although the difficulties in the way of detecting other satellites seem overpowering, it is encouraging that as recently as 1948 and 1949 G. P. Kuiper discovered a close satellite of Uranus and a distant one of Neptune.

—Journal of the Royal Astronomical Society of Canada

HELIOCENTRIC POSITIONS OF THE PLANETS, MARCH



SPACE SATELLITES

Since the last issue of the "MAP" went to press, the whole satellite program has been thrown into a turmoil by the successful launchings in October and November by the Russians. The "MAP" cannot give much help in giving directions for seeing either of the satellites since they are very close to the surface of the earth (relatively speaking) and accordingly are visible over a confined area at any one time. Your best source of information for locating either satellite and future satellites, is your daily newspaper.

It goes without saying that the era of space travel has arrived. The American Rocket Society has put a definite proposal before President Eisenhower, covering the period to 1983, with a long range program for the period subsequent to that date. With an initial annual budget of $100,000,000.00 the following would be accomplished:

Within five years, earth satellites would be launched with instrument loads up to one ton.

Within five to ten years, instrument packages weighing 100 to several hundred pounds would be sent around or landed on the moon.

Within the same period, research comets would be sent to gather data in the regions between Venus and Mars.

Within ten years, manned satellites would circle the earth. A little later, the satellites could be made big enough to accomodate crews of four to perhaps ten persons.

Within fifteen years, manned vehicles would fly around the moon.

Within twenty years, expeditions would land on the moon and return.

Your address, as printed on the mailing wrapper, contains your expiration information — the first digit is the *issue number,* followed by the year. For example, "2-58" means that the last issue of the subscription would be the second (April - May - June) of 1958. If there is any discrepancy in expiration, or address, kindly advise.

A VICKSBURG SUBSCRIBER WRITES TO THE NEWSPAPER

OUR CHRISTMAS STAR

Editor, Evening Post:

Only a few of us, comparatively speaking, have seen Sputnik: but, all of us can enjoy the beautiful Venus, now the only evening star—a big, bright gem in the west. It has passed the greatest elongation from the Sun and will achieve the greatest brilliancy the 24th of this month when it moves from Sagittarius into Capricornus.

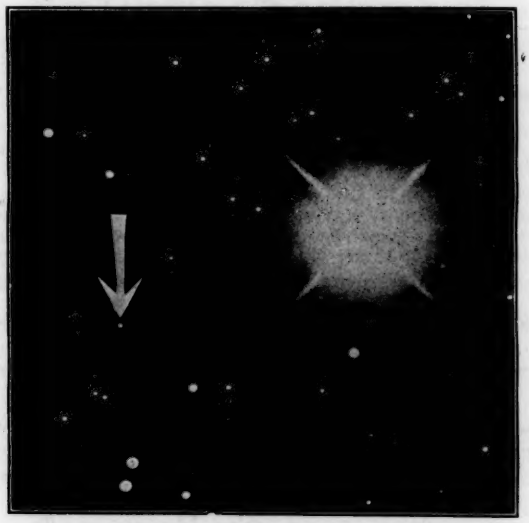
Venus, like the Moon, changes phases, but requires 8 months' time and reverses the order—the dimmest when full, and the brightest in crescent shape, and appearing much larger than the new Moon.

Sometimes I wonder, since Venus stays so near by and again this Christmas Eve will shine the brightest, if it isn't to remind us of the journey the Wise Men made westward toward a star, to see the newborn King, and if Venus wasn't that star keeping watch over Him, and if the Wise Men didn't name Venus, the Queen of the Sky: "The Star of Bethlehem"?

Yours sincerely,
MRS. ALBERT M. BONELLI

PERIOD OF ROTATION OF PLUTO

Because Pluto is small and is the most distant planet from the sun (more than 3600 million miles) it appears like a star in even the biggest telescopes. It is therefore impossible to determine the period of rotation by directly



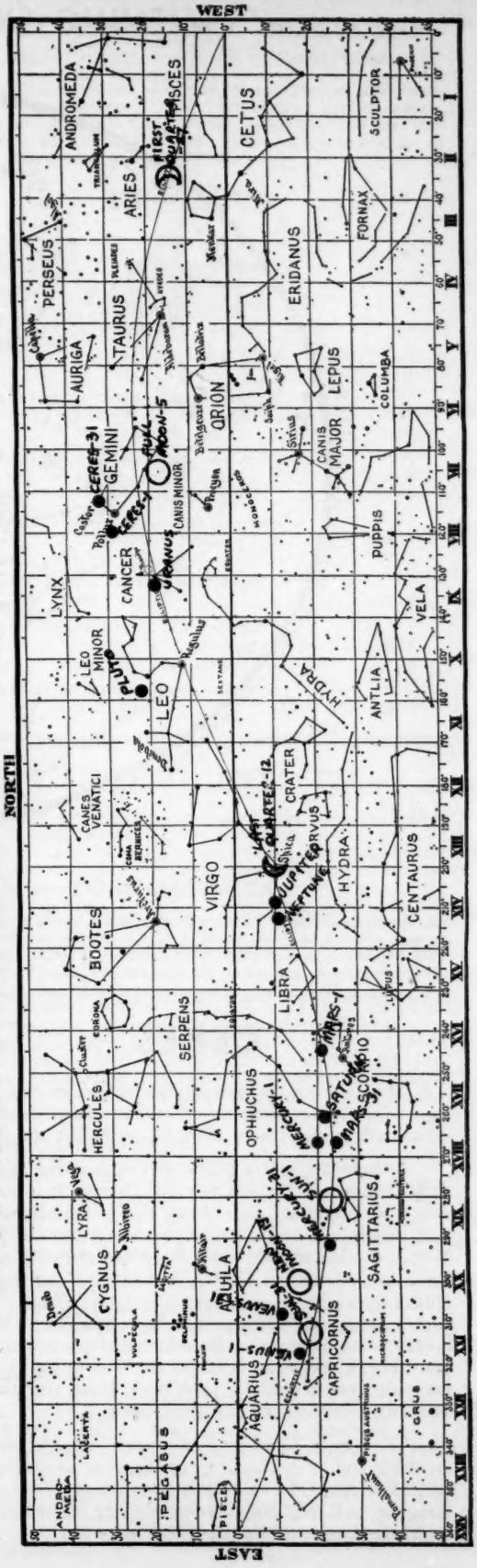
Pluto at the time of discovery.
The bright star is Delta Geminorum, magnitude 3.5.

observing any markings on the surface. However, Merle F. Walker and Robert Hardie, using the 42-inch reflector of the Lowell Observatory, found that the brightness of Pluto changes periodically *(Science News Letter,* vol. 69, no. 4, 1956). This they interpret as being caused by markings on the surface changing the apparent magnitude as it rotates. The variation in brightness is only a tenth of a magnitude. The period of rotation which Walker and Hardie found is 6.390 days. This was determined by combining their recent observations with earlier photoelectric observations by Walker at Mount Wilson and Palomar Observatories and by Kuiper at Yerks Observatory.

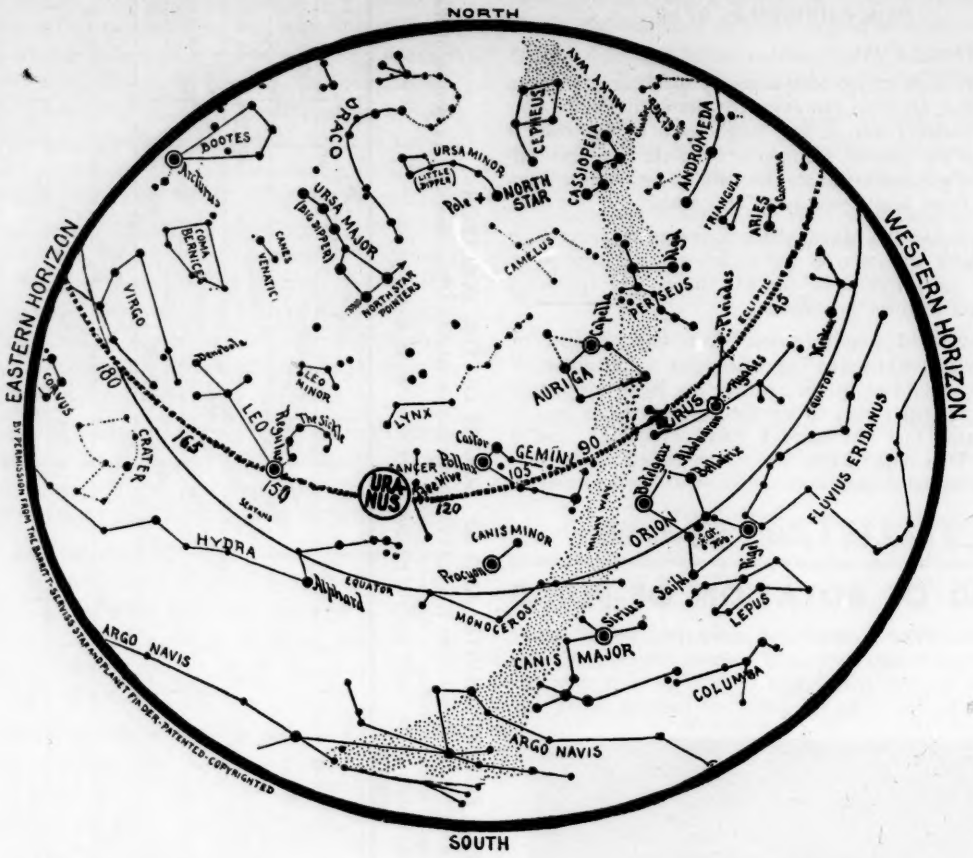
—Journal of the Royal Astronomical Society of Canada

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current month—January, 1958—Anywhere in the world.
Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.



EVENING SKY MAP FOR MARCH



AT 9:00 P.M., MAR. 1 **8:00 P.M., MAR. 15** **7:00 P.M., MAR. 31**

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

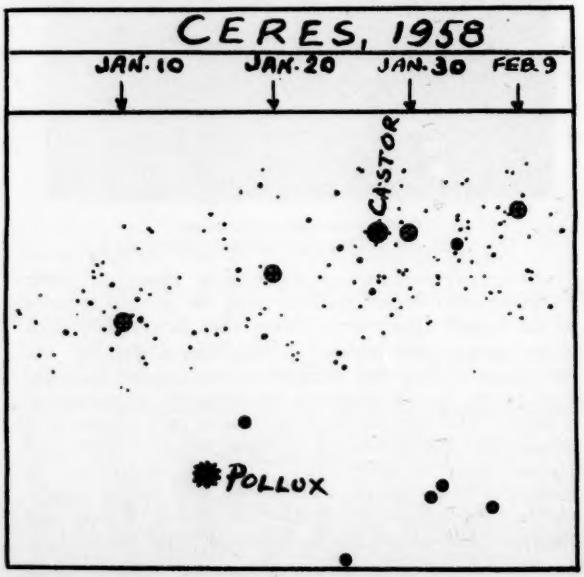
CERES

This is an exceptional opportunity to see one of the asteroids or minor planets. Ceres follows a track in Gemini which will bring it very close to the bright star, Castor.

By accident, and accident only, Ceres, the largest of the asteroids, was the first to be discovered. It is not however, the brightest, since Vesta holds that honor and, occasionally, can be seen with the naked eye. On January 1, 1801 the Italian astronomer Piazzi was checking out stars listed in an erroneous catalog, and found Ceres. In 1802, Olbers found the second asteroid (Pallas); Harding found Juno in 1804, and Olbers made his second find—Vesta—in 1807. No more asteroids were found for a number of years. Hencke began an intensive search in 1830, which did not yield results until 15 years later. From that time on, asteroids were discovered in great numbers.

This winter, Ceres comes to opposition on about January 16th, and at its closest to the earth at about the same time, is 151,000,000 miles away. Magnitude is 7.1, which brings it well into binocular range. The 7x50 binoculars reveal the asteroid easily.

—*Continued on Page 11*



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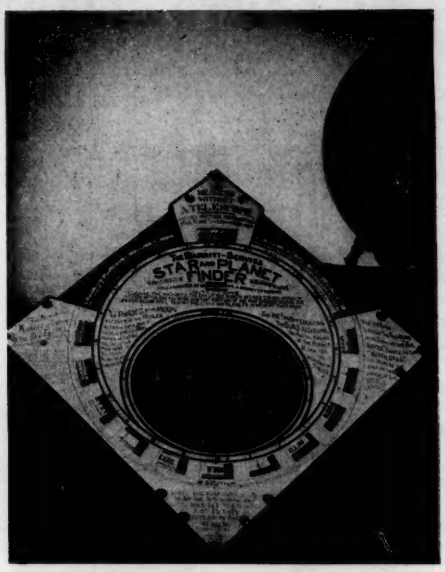

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Price $1.00

Make all remittances payable to
THE MONTHLY EVENING SKY MAP
Box 88 Rutherford, N. J.

—Continued from Page 10

Our chart shows the positions of Ceres at 7 pm E.S.T. of the dates indicated, as it retrogrades. The chart shows north to the top, and west to the right. The smallest dots on the chart indicate stars of 8th and 9th magnitude—much fainter than Ceres. Ceres motion from day to day is rapid, and makes it very easy to identify the planet with certainty.

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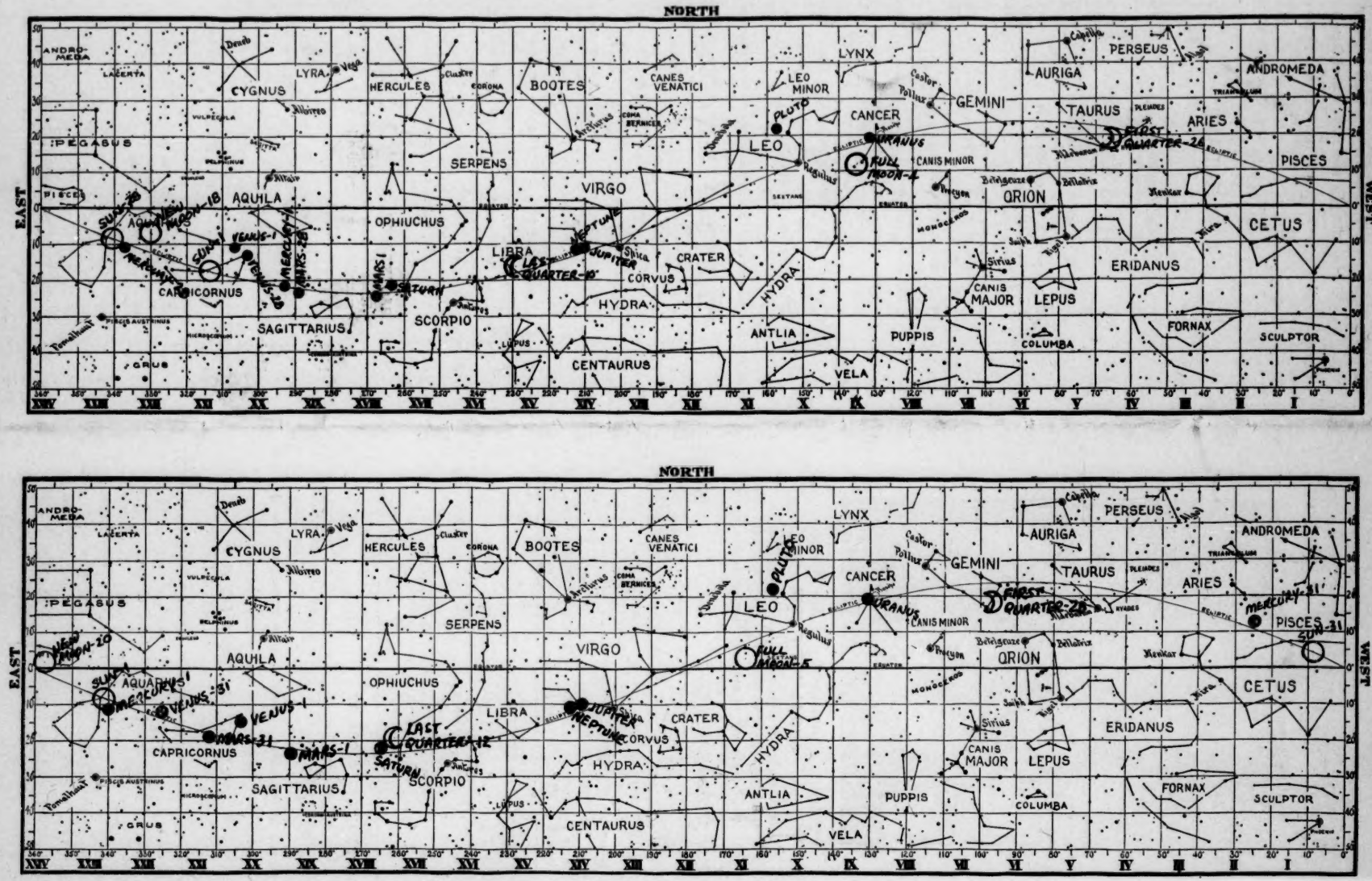

Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.